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STRONGYLOVELIA (VELIIDAE) AND *METROBATOPSIS* (GERRIDAE) AND ASSOCIATED PLEUSTON HEMIPTERA OF WEST NEW BRITAIN

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A brief survey of the pleuston bugs of the Von River, West New Britain are given. *Strongylovelia priori* sp. n. is described (Veliidae: Haloveliinae) with distributional data from other localities. Two species of *Rhagovelia* (Veliidae: Rhagoveliinae) are listed. *Metrobatopsis flavonotatus* Esaki (Gerridae) is described and figured as its specific identity is uncertain. Other gerrid genera and species are listed, viz. *Ptilomera*, *Limnometra* and *Tenagogonus*.

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Key words. – Hemiptera; *Strongylovelia*; *Metrobatopsis*; New Britain; new species.

During a single visit to the Von River near Dami, West New Britain, the pleuston species diversity was found to be rather unusual as it included species characteristic of both lentic and lotic habitats. The river runs through a deeply cut channel of what appears to be volcanic debris and silt. Substrate varying between coarse sand and gravel in slower shallow stretches and much deeper extremely fast stretches with large stone and boulders. The banks are steep, banded alternately with black layers and broader intervening pale brown bands of silt. The habitat is deeply shaded by overhanging secondary forest and in places a dense sub-shrub layer.

Supplementary data from other regions of Papua New Guinea are given for *Strongylovelia priori* sp. n., *Metrobatopsis flavonotatus* Esaki and other species of Veliidae and Gerridae. Data for *Rhagovelia* (Veliidae), *Ptilomera*, *Metrobatopsis* and possibly some species of *Tenagogonus* are found on slow-fast lotic habitats, whereas *Limnometra* species (all Gerridae) most commonly found on lentic habitats. Published data on *Strongylovelia* give no indication of habitat preferences.

Systematics

Veliidae, Haloveliinae

Strongylovelia priori sp. n.
(figs. 1-19, table 1)

Type material. – Holotype ♂: Papua New Guinea, West New Britain, Balima River near Ulamo, 19.viii.1989, R. N. B. Prior. – Paratypes (all Papua New Guinea, West New Britain): Von River, Banaule near Dami, 21.iii.1990, 12♀; Tamari Creek, freshwater/saline habitat, 11.xii.1988, R. N. B. Prior, 1♀. The holotype and a series of paratypes in OXUM, other paratypes in RMNH.

Description

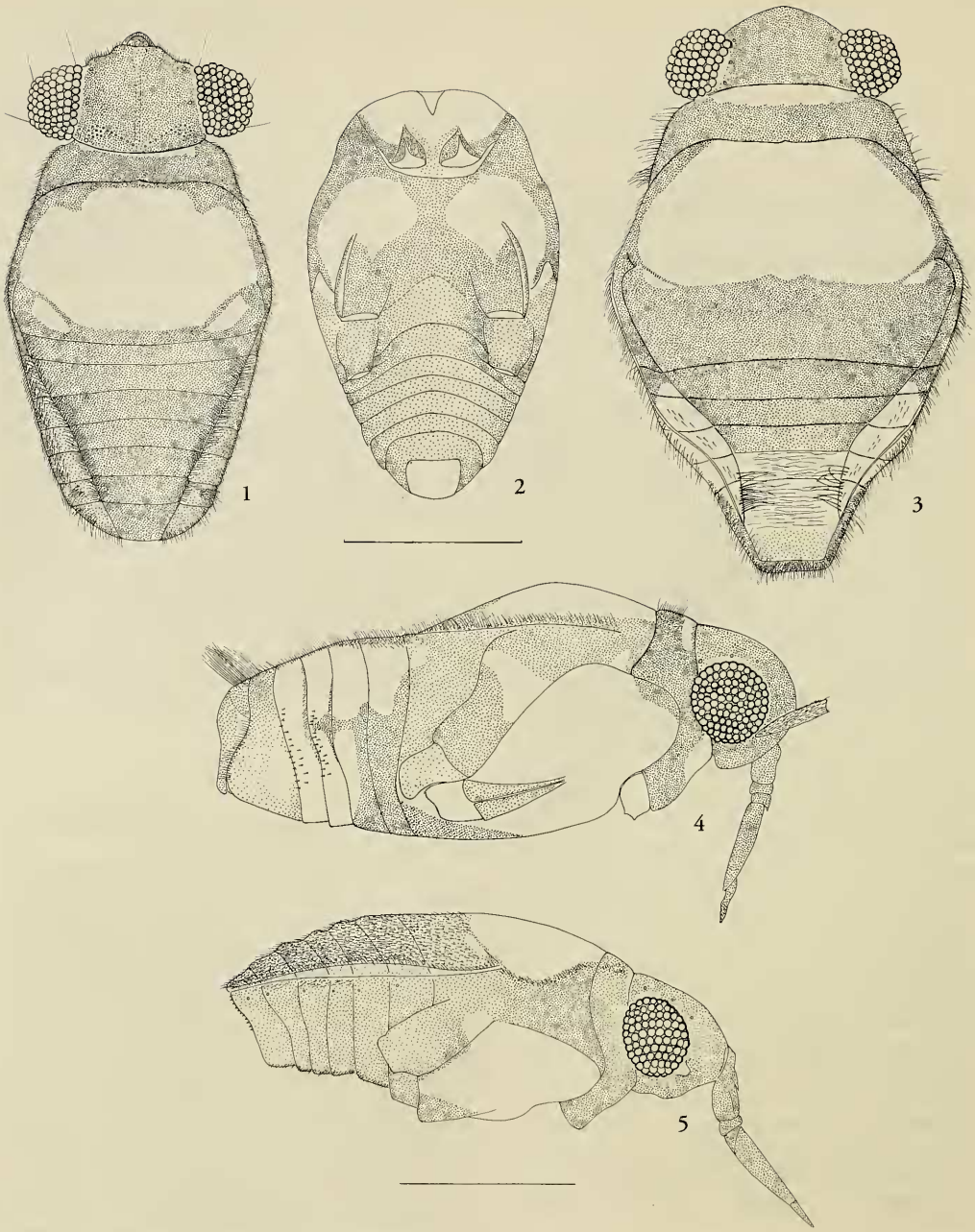
Adult apterous. Male 1.6 mm long, maximum width 0.77 mm, female 1.58-1.76 mm long, maximum width 0.86-0.99 mm.

Coloration. – Female: Head black, latero-posterior margins and cephalic trichobothria dark yellow tinged pale red. Eyes silvery grey. Antennae black, first segment ventrally pale yellow. Rostrum shining dark brown to black. Pronotum black, anterior margin narrowly pale yellow. Mesonotum broadly pale yellow, lateral margins black. Metanotum with two (1+1) yellow-orange blotches narrowly separated from yellow mesonotum. Anterior tergites uniformly black, distal tergites faintly iridescent. Connexivum posteriorly broadly pale yellow. Propleura narrowly black posterior of eyes, mesopleura broadly pale yellow with upper margin and most of metapleura black. Metasternum pale yellow. Sternites laterally yellow, posteriorly uniformly blackish-brown, ventrally black (fig. 3).

Legs: Front leg, trochanter and femur pale yellow, distally femur narrowly annulated dark brown. Inner margin of tibia anteriorly pale yellow, remainder and tarsi dark brown. Middle and hind legs black, trochanter and proximal part of hind femur pale yellow.

Male similar to female, but pale yellow pronotal band narrower. Meso and metanotum and meso and metapleura as in female. Tergites black, not iridescent posteriorly. Connexivum and sternites black.

Structure. – Female subovate, length 1.82x greatest



Figs. 1-5. *Strongylovelia priori* sp. n., 1-2, 5 holotype ♂, 3-4 paratype ♀. – 1, dorsal habitus; 2, ventral aspect; 3, dorsal habitus; 4, side view; 5, side view Scale line 0.5 mm.

width across thorax. Head length about 1.6x greatest width. Eye width about 0.4x width of head between eyes. Thoracic dorsum clearly raised above tergites (fig. 4). Mesonotum and metanotum with sparse adpressed pubescence. Pro and mesopleura with much longer prominent curled black pubescence. Apical tergites broad, covered with adpressed greyish pubescence, distal tergites less pilose, shining greenish iridescent. Connexivum clearly raised above tergites, apically sinuate, curving and more erect posteriorly. Connexivum with long black curled hairs. Viewed laterally, connexivum posteriorly with a cluster of erect black hairs (figs. 3-4).

Female genitalia (figs. 18-19). Tergum 8 large, first gonocoxae elongate. First gonapophyses distally with scattered prominent spines. Second gonapophyses

Figs. 6-9. *Strongylovelia priori* sp. n. – 6, holotype ♂, antenna; 7, same, hind leg; 8, paratype female, antenna; 9, same, hind leg. Scale line 0.5 mm.

connected by a lightly sclerotised bridge, distally with fringes of fine hairs. Proctiger viewed laterally elongate, subquadrate from dorsal aspect.

Male elongate, about 2x greatest width across thorax. Head length slightly less than greatest head width between eyes. Greatest eye width about 0.4x head width. Tergites slightly raised, connexivum continuous with tergites. Lateral margins of prothorax, tergites and connexivum covered with long hairs. Sternites not pilose with scattered minute spicules, more prominent and in organised row on distal segment (figs. 1, 2, 5).

Male genitalia (figs. 14-17): Genital segment hidden within abdomen and moderately sclerotised, proctiger prominent. Parameres symmetrical, viewed laterally long and slender, from dorsal aspect sinuate.

Legs: Male front femur moderately incrassate, tibia distally with a row of fine spinose hairs (fig. 10).

Table 1. Proportions of leg segments of *Strongylovelia priori* sp. n.

	Femur	Tibia	Tarsi I	Tarsi II
Male front leg	60	60	8	20
Female front leg	63	63	8	22
Male middle leg	130	108	44	25
Female middle leg	141	105	40	25
Male hind leg	87	77	13	20
Female hind leg	80	72	13	15

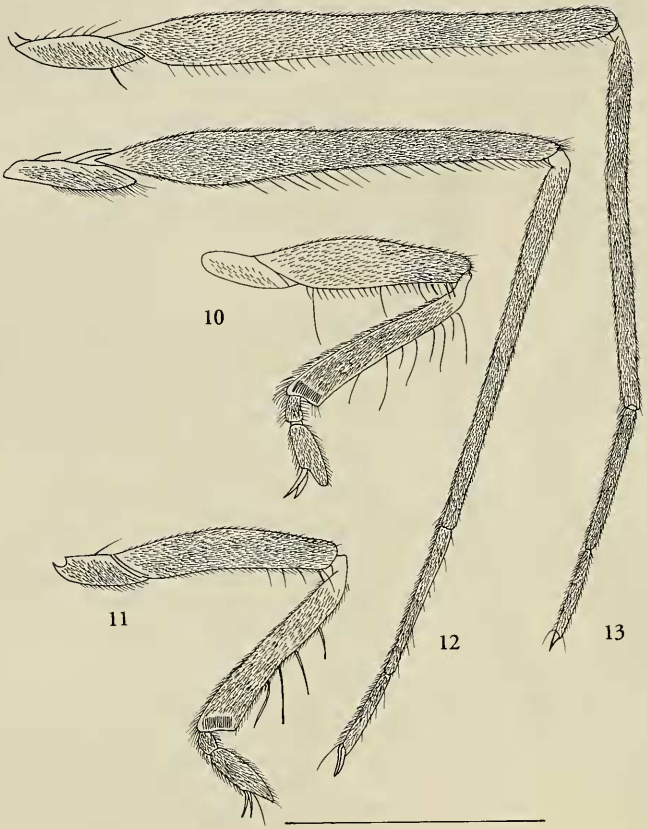
Middle femur about half length of male (21:41) (fig. 12). Hind femur slightly more robust than middle femur, ventrally with numerous long spine-like hairs (fig. 7). Female front femur slightly curved, tibia distally with a row of fine spinose hairs (fig. 11). Middle femur about half length of female (fig. 13). Hind femur not noticeably thicker than middle femur, ventrally fringed with fine hairs (fig. 13).

Antennal segments 1-4 male (fig. 6) 26 : 37 : 63 : 52. First segment about 0.66x head length, second segment very robust. Female segments 1-4 (fig. 8) 27 : 33 : 50 : 42. First segment just over half median head length.

Remarks

Strongylovelia priori sp. n. is similar in general appearance to *S. formosa* Esaki (1924) described from two females from Taihoku, Northern Formosa. The hind femora of *formosa* are almost entirely pale and the pronotum and connexivum of the female are uniformly dark brown to black. Lundblad (1933) figured the male of *formosa* from Central Sumatra, Singkarak. The parameres of *formosa* sensu Lundblad are proximally very broad compared with *priori*. Lundblad gives the relative lengths of male antennal segments 1-4 as 50 : 53 : 92 : 67. He states 'In his Figure 1, Esaki, has shown the 1st segment too short, because it has apparently been drawn from an antenna that has not been detached. The condyle is therefore not visible. In fact the 1st and 2nd segments agree so closely in their length that no differences can be detected except by measuring them'. Figures 6 and 8 of *priori* are drawn from slide mounted partially cleared preparations.

Esaki described a second species, *S. albicollis* from New Guinea, Erima, Astrolabe Bay, based on a apterous female 1.5 mm long and a macropterous female 2 mm long. The apterous *albicollis* is distinguished from *priori* by the broadly yellowish white pronotum and the two yellowish white blotches on the black mesonotum. The yellowish white coloration of part of the connexivum is similar to *priori*. The variation of coloration between male and females of



Figs. 10-13. *Strongylovelia priori* sp. n. – 10, holotype ♂, front leg; 11, paratype female, front leg; 12, holotype male, middle leg; 13, paratype female, middle leg. Scale line 0.5 mm.

Strongylovelia and iridescence of the distal tergites have not previosuly been commented upon. Andersen (1982) figures the apterous female of *S. formosa* and forewing of macropterous form showing the extreme reduction of the venation.

The longest series of *Strongylovelia* were collected from shaded moderately slow lotic stretches of the Von River, occurring with *Metrobatopsis* (Gerridae). Because of their small size, they were impossible to see on the surface of the river.

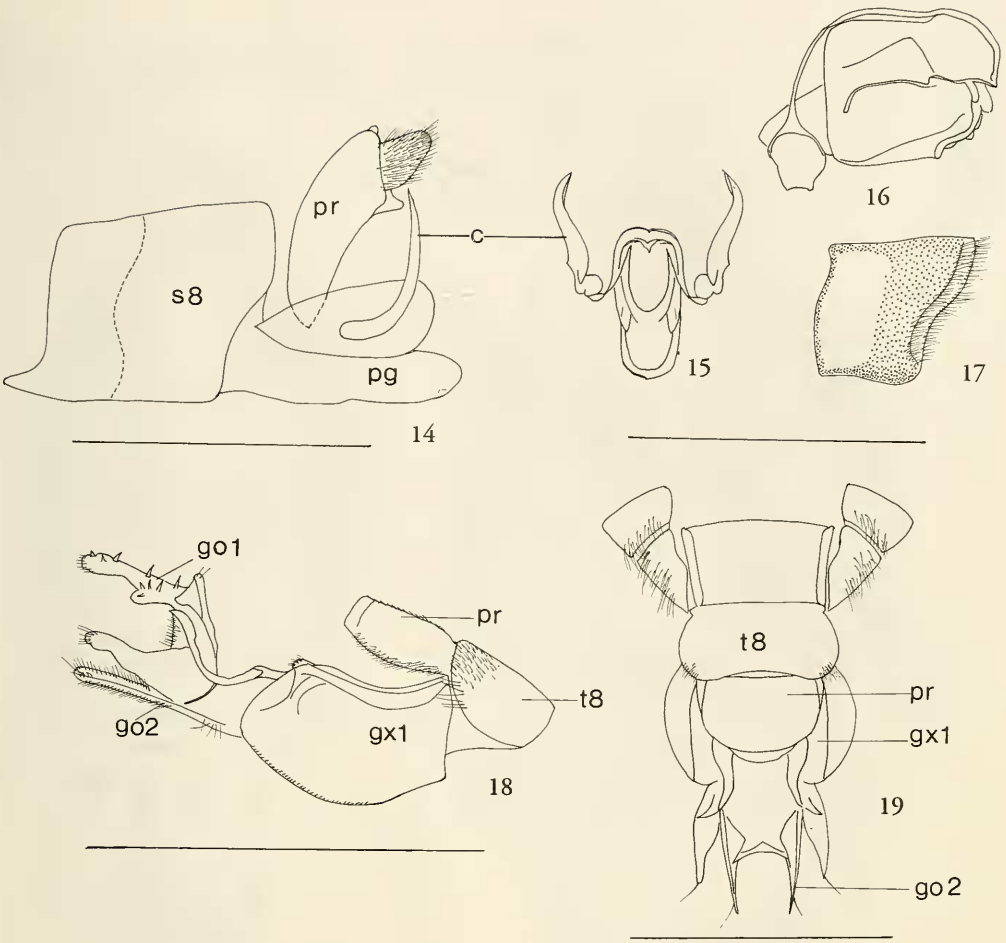
Etymology. – A noun in the genitive case. This elusive haloveline is dedicated to Dr. R. N. B. Prior for his invaluable assistance whilst in West New Britain and for the collections he made for me during his tenure at Kimbe, West New Britain.

Rhagoveliinae

Rhagovelia biroi Lundblad

Rhagovelia biroi Lundblad, 1936: 13-14: type series New Guinea, Erima, Astrolabe Bay and Stephansort and East New Britain, Herbertshöhe [Kokopo near Rabaul] in HNHM [not examined]; Polhemus & Polhemus 1988: 165.

Material. – Papua New Guinea, West New Britain, Von River, Banaule near Dami, 21.iii.1990, I. Lansbury, 17♂ 10♀, all apterous. This series were found principally along the margins amongst fallen branches. It is moderately common at Tamari, Bialla and Bilomi River, Kimbe Bay, West New Britain. Polhemus & Polhemus (1988) place *biroi* in the '*novacaledonica* group'.



Figs. 14-19. *Strongylovelia priori* sp. n., 14-17, holotype ♂ genitalia; 18-19, paratype female – 14, segment 8 and ancilliary structures, scale line 0.25 mm; 15, genital capsule dorsal aspect; 16, same, side view; 17, part of segment 8. (Abbreviations S8, 8th segment; Pr, proctiger; pg, pygophore; c, clasper (paramere)). – 18, side view of ovipositor; 19, dorsal aspect of ovipositor. (Abbreviations t8, tergite 8; gx1, first gonocoxa; go1-go2, first and second gonapophysis; pr, proctiger). Scale lines 0.5 mm.

Rhagovelia papuensis Lundblad

Rhagovelia papuensis Lundblad, 1936: 28-30: type series New Guinea, Erima, Astrolabe Bay and Stephansort and East New Britain, Herbertshöhe [Kokopo near Rabaul] in HNHM [not examined]; Andersen 1982: 152; Polhemus & Polhemus 1988: 165.

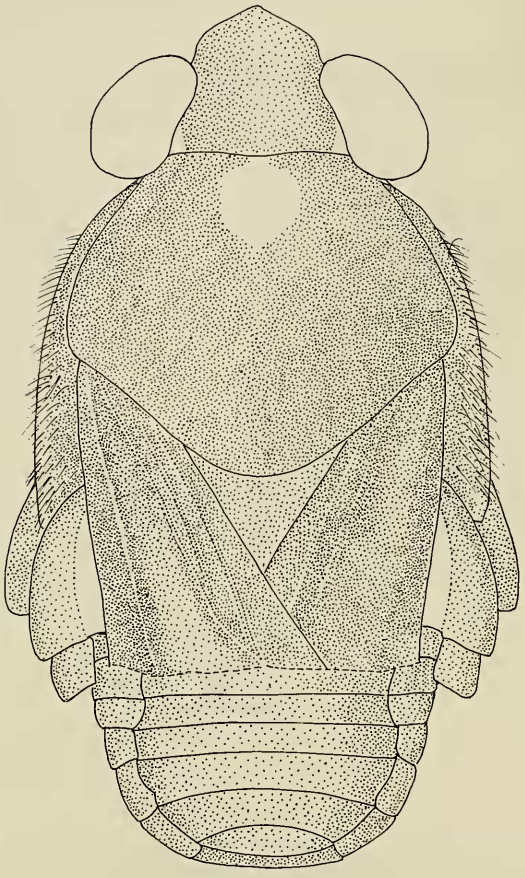
Material. – Papua New Guinea, West New Britain, Von River, Banaule near Dami, 21.iii.1990, I. Lansbury, 1♀ apterous. Found in small numbers at Tamari Creek and Balima River, Bialla where it was found in dense shade. Andersen (1982) figures the apterous male of *papuensis*. Polhemus & Polhemus (1988) include about twenty species in the '*papuensis* group', which includes also *R. australicus* Kirkaldy, an australian endemic found in the N. Queensland rain forest habitats.

Gerridae, Trepobatinae

Metrobatopsis flavonotatus Esaki
(figs. 20-26)

M. flavonotatus Esaki, 1926: 144-146: type series New Guinea, Erima, Astrolabe Bay, in HNHM [not examined]; Hungerford & Matsuda 1959: 31-35 [lectotype ♂ designated]; Matsuda 1960: 367-371, 628-629.

Material. – Papua New Guinea, West New Britain, Von River, Banaule near Dami, 21.iii.1990, I. Lansbury, 13♂ 1♀ apterous, 1♀ macropterous and immatures; New Hanover, Lavonga Mission, small freshwater stream, 31.x.1989, R. N. B. Prior, 4♂ 2♀ apterous and numerous immatures.



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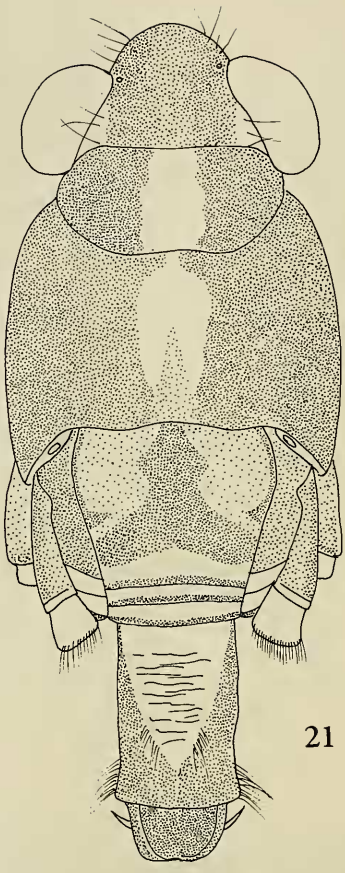

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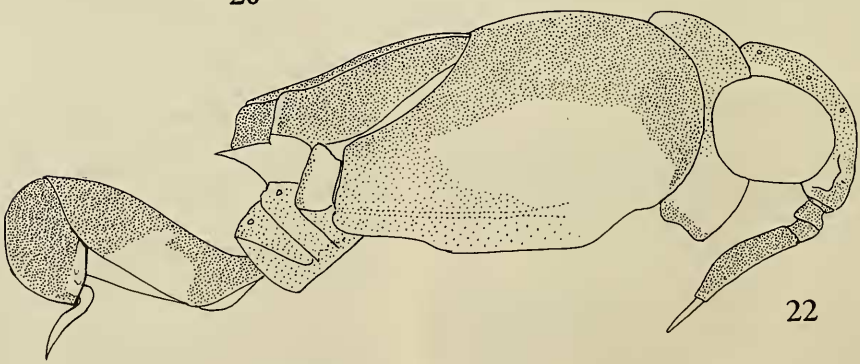

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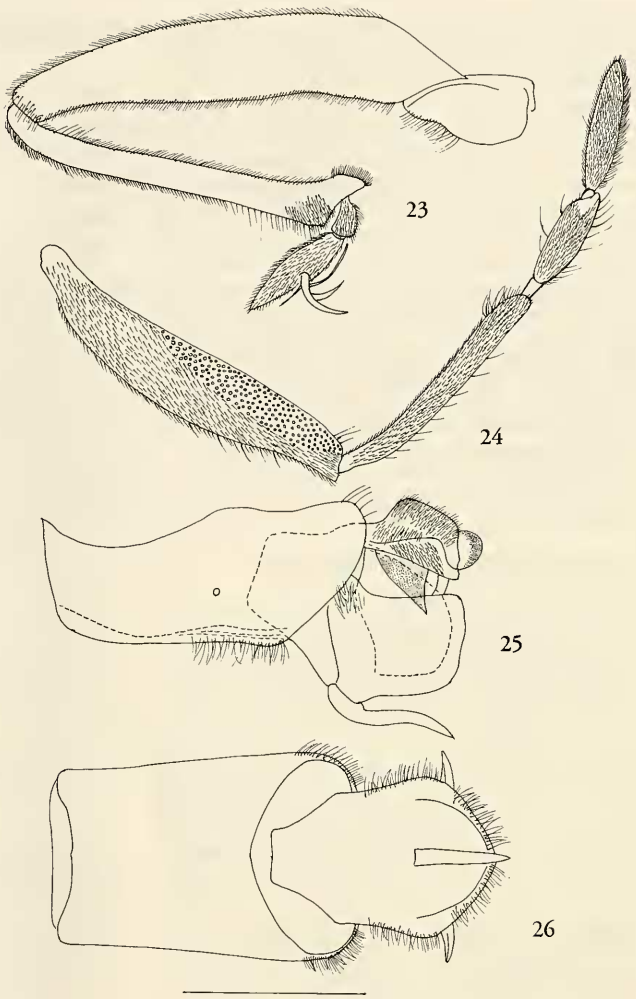
Figs. 20-22. *Metrobatopsis flavonotatus* Esaki. – 20, macropterous female; 21, apterous male, dorsal habitus; 22, apterous male, side view. Scale line 1 mm.



Figs. 23-26. *Metrobatopsis flavonotatus* Esaki, male. – 23, front leg; 24, antennae; 25, genital capsule side view; 26, genital segment, ventral aspect.

Esaki (1926) and Hungerford & Matsuda (1959) describe the variation in colour pattern and general structural features, the latter describing the male genitalia. The series from West New Britain and New Hanover differ slightly in the structure of the male genitalia.

Description. – Adult apterous. Male 2.34-2.64 mm long, maximum width 1.0-1.1 mm; females including macropterous form with damaged wings (fig. 20) 2.6 mm long, 1.32 mm wide.

Coloration: Male. Head, pronotum and mesonotum velvety black. Basal inner margin of head adjacent to eyes reddish brown. Pronotum and mesonotum with a prominent pale yellow longitudinal stripe, distal margin of mesonotal stripe evanescent blue. Metanotum, tergites, connexivum and metacetabulae velvety black with bluish evanescent patches, very noticeable on metanotum and tergites. Genital segments black, proximally iridescent blue, lateral margins pale yellow (figs. 21-22). Pro and mesopleura pale yellow, distally the latter black overlaid with iridescent blue. Lateral margins of sternites blackish brown becoming paler ventrally. Genital segment ventrally pale yellow, distally black. Process of pygophore, suranal plate and paired processes shining black. Antennae black, proximal third of first segment pale yellow. The pale band is much more conspicuous when the gerrid is alive, likewise the proximal pale yellow band on front femur. Trochanter of middle and hind legs pale yellow, remainder of legs black.

Macropterous female (fig. 20) similar to male. Pronotum with a yellowish patch antero-mesially. Remnants of wings dark brown, venation black.

Male structure. Antennal segments 1-4 (fig. 24) 39.5 : 25 : 11.5 : 14. The ratios agree with Hungerford & Matsuda (1959); they are however, rather more robust than those of the the female, contrary to Hungerford & Matsuda (1959). The inner median and distal surface of first segment with an area of pit-like structures. Front leg (fig. 23) femur proximally robust, narrowing distally, tibia with a very prominent blunt pilose projection distally. Eighth segment long, laterally slightly sinuate, but not constricted as figured by Hungerford & Matsuda (1959), but does resemble figure by Matsuda (1960). Segment dorso-anteriorly with transverse striations (fig. 21). Ninth segment (figs. 25-26) with a prominent curved process usually ventrally but in some males the process is in a latero-ventral position. Suranal plate with a pair of sharply acuminate processes usually not visible (fig. 25).

Gerrinae

Tenagogonus (*T.*) *kampaspe* (Kirkaldy)

Gerris kampaspe Kirkaldy, 1900: 804: type series New Guinea, Rigo and Kellesi in SNOW [not examined].
Limnometra kampaspe; Lundblad 1933: 371 [listed].
Tenagogonus kampaspe; Hungerford & Matsuda 1958: 386-388 [redescription, locality Dilo Loria, vi, vii. 90]; Matsuda 1960: 212, 501 [species groups].

Material. – Papua New Guinea, Milne Bay Province, Naura, lotic stony river, 29.ix.1989, R. N. B. Prior, 1♂ macropterous; West New Britain, Von River, Banaule near Dami, 21.iii.1990, I. Lansbury, 3♀ apterous. Overall length of male including wings 5.39 mm, apterous female between 5.8-6.0 mm long.

Limnometra monochroma Nieser & Chen

Limnometra monochroma Nieser & Chen, 1992: 21-23.

Material (type series). – Papua New Guinea, West New Britain, Buluma nr Dami, rain water pit, 17.i.1989, R. N. B. Prior, 2♂ 1♀ (incl. 1♂ holotype) (OXUM); West New Britain, Von River, Banaule near Dami, torrential habitat, 21.iii.1990, I. Lansbury, 2♀ (OXUM).

Ptilomerinae

Ptilomera breddeni Hungerford & Matsuda

Ptilomera breddeni Hungerford & Matsuda, 1965: 451-454: types New Guinea, SE Haveri; SE Paumenu River; Milne Bay (SNOW); Andersen 1982: 183, 191, 211.

Material. – Papua New Guinea, West New Britain, Von River, Banaule near Dami, 21.iii.1990, I. Lansbury, 1♂ macropterous, 10♂ 10♀ apterous. Collected in small numbers on faster stretches and easily able to evade capture.

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